Introduction

Cystic fibrosis (CF) patients are a unique group of patients at high risk of infection with the potential for cross transmission of organisms not normally associated with severe infection in other patient groups. CF Trust standards recommend that specialist CF Centres should have their own local IPC policy.

Scope

All CF patients cared for in Trust inpatient and outpatient facilities.

Aims

To outline recommendations for prevention of cross transmission of infection in CF patients.

Duties (Roles and responsibilities)

It is the responsibility of all staff involved in the care of CF patients to ensure that they understand and implement this policy.

The Infection Prevention and Control Committee (IPCC) and CF teams will review the procedure and any new evidence base within the time frame set out in the procedure.

Definitions

CF – Cystic Fibrosis
Bcc – *Burkholderia cepacia* complex
MRSA – Meticillin resistant *Staphylococcus aureus*
HTPA – highly transmissible *Pseudomonas aeruginosa*
CFI – Centre for Infections, Colindale
CNS – clinical nurse specialist
IPCT – Infection Prevention and Control Team

The Newcastle upon Tyne Hospitals NHS Foundation Trust

Infection Prevention and Control in Cystic Fibrosis Patients (Adult and Paediatric)

<table>
<thead>
<tr>
<th>Version No.</th>
<th>2.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective From</td>
<td>1 October 2015</td>
</tr>
<tr>
<td>Expiry Date</td>
<td>1 October 2018</td>
</tr>
<tr>
<td>Date Ratified</td>
<td>22 September 2015</td>
</tr>
<tr>
<td>Ratified By</td>
<td>Clinical Policy Group</td>
</tr>
</tbody>
</table>
6 General principles

6.1 Specific pathogens

6.1.1 Pseudomonas aeruginosa

*Pseudomonas aeruginosa* infection is common in people with cystic fibrosis, and chronic infection with *P. aeruginosa* can be associated with decline in pulmonary function and a worse prognosis. *P. aeruginosa* can be acquired from other people with cystic fibrosis.

Patients colonised with *P. aeruginosa* may be classified according to the Leeds criteria: chronic (at least 50% of sputum samples positive over the preceding six months) or intermittent (less than 50% of sputum samples positive over the preceding six months). The CF Registry defines chronic pseudomonas infection as >3 isolates in the last year.

Highly transmissible strains of *P. aeruginosa* (HTPA) are widespread in the Specialist CF Centres in the UK. The most prevalent and clinically significant strains in the UK are Liverpool, Manchester [MEN] and Midlands I. There is evidence that some transmissible strains are associated with a worse clinical outcome.

In some clinics, effective hygienic measures and patient segregation according to microbiological status, appears to have reduced the incidence of acquisition and cross-infection of *P. aeruginosa*. It is still not clear which of the measures is most important, or whether all are necessary.

6.1.2 Burkholderia cepacia complex (Bcc)

*Burkholderia cepacia* complex infection is associated with an increased morbidity and shortened life-expectancy for people with cystic fibrosis. The relative virulence of individual Bcc species, and strains within a species, remains unclear. However evidence suggests that *B. cenocepacia* is the species with the greatest potential virulence for people with cystic fibrosis. Colonisation with Bcc genovovarIII (*B. cenocepacia*) is considered a contraindication to transplantation in Newcastle.

Cohort segregation of people with CF with Bcc to take account of the species and strain involved has been shown to reduce the spread of the infection.

6.1.3 Meticillin resistant *Staphylococcus aureus* (MRSA)

MRSA infection will lead to a reduction in options for antibiotic treatment and a likelihood of deterioration in lung function, therefore MRSA infection should be avoided.
MRSA may also lead to serious infections in intravenous devices and gastrostomies.

6.1.4 Mycobacterium abscessus

Of the non-tuberculous mycobacteria, *Mycobacterium abscessus* (including subspecies *M abscessus*, *M bolletii* and *M massiliense*) is associated with worse clinical outcomes and colonisation with this organism is a relative contraindication to transplantation.

Recent evidence suggests cross transmission between patients is possible.

*M chelonae* is closely related to *M abscessus* and difficult to distinguish in the laboratory; however evidence both of cross transmission and of worse clinical outcomes is lacking. It is not a contraindication to transplantation.

For the purposes of this policy, patients colonised with ‘*M abscessus*’ refers to those patients with at least one isolation of *M abscessus* confirmed by molecular methods or highly suggestive by local methods AND a high clinical suspicion of infection; or two isolations of *M abscessus* within the past year of which one has been confirmed by molecular methods (see section 6.5.4).

6.1.5 Respiratory viruses

Patients with CF are not more susceptible to infection with respiratory viruses; however the clinical presentation of infection may be more severe in CF patients and require admission. Infection control principles are the same as for suspected viral infections in non-CF patients.

6.2 Care of outpatients

6.2.1 Clinic schedule

Patients colonised with *Pseudomonas aeruginosa* should be seen in different clinic hours to those that have not when possible.

Patients colonised with transmissible strains of *P. aeruginosa* should be seen in different clinic hours to those that have not when possible.

Patients colonised with Bcc should be seen outside of normal clinic hours and separately from other CF patients. They should not be cohorted unless they possess the same species and strain.

Patients colonised with *Mycobacterium abscessus* should be seen in different clinic hours to those that have not when possible. Patients with
new isolates of *M chelonae* or new isolates of uncertain species should NOT be included until final molecular identification has been made (see 6.1.4 and 6.5.4). Procedures outlined in this policy are intended to minimise risks to patients colonised with *M chelonae* as well as those not colonised.

Patients colonised with MRSA should be seen at the end of a clinic schedule when possible.

### 6.2.2 Waiting areas

Patients are shown directly to clinic rooms on arrival and asked not to wait in communal areas. Patients are also advised not to wait in other communal areas such as radiology and pharmacy and relatives may wish to attend pharmacy on the patient’s behalf when possible.

### 6.2.3 Clinic rooms

Clinic staff should visit the patient in the same clinic room during their visit. Spirometry and height and weight measurements should take place in the patient’s own room.

Detergent wipes should be made available for cleaning items such as stethoscopes.

### 6.2.4 General precautions

Standard precautions are advised. Hand hygiene is paramount. For physiotherapy, aerosol generating procedures and close patient contact, staff should consider wearing disposable aprons plus/minus gloves depending on the procedure undertaken.

Patients who are colonised with MRSA should be managed in accordance with Trust policy.

### 6.2.5 Decontamination

Following each patient’s departure, surfaces within the room should be decontaminated with universal sanitising wipes, and the room should be fully cleaned at the end of each clinic in accordance with the Trust Cleaning and disinfection policy. Attention should be paid to sinks and taps.

Clinic rooms should be left well ventilated (an open window or ventilated room) for at least one hour (or non-ventilated overnight) after being occupied by a patient colonised with Bcc or *M abscessus* and cleaned after this period.
6.2.6 Equipment
Respiratory equipment should be cleaned, disinfected and dried between uses. Bacterial filters should be fitted to spirometers. Single use items should be used where possible and these items disposed of between patients. Staff and patients should wash their hands before and after using equipment.

Designated flow heads should be used for spirometry in patients colonised with *M abscessus* and individual flow heads for patients colonised with Bcc.

Stethoscopes should be decontaminated using detergent wipes after every patient examination.

6.3 Care of inpatients

6.3.1 CF ward/outlying wards
All patients should be isolated in single rooms with bathrooms not shared by other CF patients where possible.

Patients who are colonised with Bcc/ *M abscessus* should be nursed away from the CF ward.

Patients who are colonised with MRSA should be isolated in accordance with Trust policy.

6.3.2 General precautions
Standard precautions are advised. For physiotherapy, aerosol generating procedures and close patient contact, staff should consider wearing disposable aprons plus/minus gloves depending on the procedure undertaken. Patients who are colonised with MRSA should be managed in accordance with Trust policy.

6.3.3 Decontamination
Rooms should be fully cleaned at the end of each patient’s stay. Attention should be paid to sinks, taps and showers.

Terminal cleaning should be undertaken after discharge of patients colonised with MRSA, Bcc, HTPA or *M abscessus*.

Toys should be cleaned thoroughly after use. Soft toys should not be used and patients should be encouraged to use their own toys where possible.
6.3.4 Equipment

Respiratory equipment should be cleaned, disinfected and dried between uses. Filters should be single use items. Single use items should be used where possible and these items disposed of between patients. Staff and patients should wash their hands before using equipment.

Designated flow heads should be used for patients colonised with *M abscessus* and individual flow heads for patients colonised with Bcc.

Stethoscopes should be decontaminated using detergent wipes after every patient examination.

6.4 Advice to patients and families

Discussion with patients and carers and explanation of the reasons for the precautions is important to avoid distress. Communication support when required should be provided for patients and carers during these discussions. Psychological and/or Social Work support is available if needed to support patients, families and carers.

Patients and families should be advised on measures to reduce the spread of pathogens.

The importance of good hand hygiene should be reinforced.

Patients should cover their mouths and noses when coughing or sneezing.

Respiratory equipment should be cleaned, disinfected and dried between uses according to the manufacturer’s instructions. Sterile water or saline should be used within nebulisers.

Socialising between non-related CF patients should be discouraged. CF patients living together should be discouraged from sharing bedrooms and respiratory equipment, and from performing airway clearance and treatments together.

CF patients attending the same school should attend different classes if possible.

CF patients should be advised to inform their workplace’s occupational health service (or student health service) about their microbiological status.

Patients are discouraged from sitting close to other in patients in communal areas of the hospital such as the restaurant.

Use of hot tubs and whirlpool baths should be discouraged.
Travel to South East Asia during the rainy season is not advised due to the risk of acquisition of *Burkholderia pseudomallei* (not part of Bcc) from soil.

### 6.5 Surveillance and communication

Respiratory samples are cultured at every clinic attendance and when the patient is unwell. Selective media for *P. aeruginosa*, Bcc and *Staph aureus* are used. Bcc plates receive prolonged incubation to improve detection of NTM. Request for full mycobacterial culture is required annually on patients producing sputum, and quarterly for those colonised with *M abscessus* until clearance is achieved. All gram negative isolates are identified to species level; all *Staph aureus* isolates have susceptibility testing performed.

Patients colonised with HTPA, MRSA, Bcc or *M abscessus* will have this status flagged as an alert organism on e-record and within their notes by way of a front sheet.

#### 6.5.1 Pseudomonas aeruginosa

All new isolates of *P. aeruginosa* are referred to Centre for Infections, Colindale, for detection of common highly transmissible strains (Liverpool, Manchester [MEN] and Midlands 1).

Further typing of isolates can be arranged on discussion with microbiology. An increased incidence of new isolations of *P. aeruginosa* would prompt further investigation.

Antimicrobial susceptibility testing is not performed on all isolates; antibiograms should not be used for detection of cross transmission.

Where possible, all new isolates of *P. aeruginosa*, and new identification of a transmissible strain, will be communicated to the CF CNS and CF consultants by email.

At least 3 consecutive negative respiratory cultures spread over a 6 month period would indicate that the organism had been eradicated. The same recommendations apply should re-infection occur.

#### 6.5.2 Bcc

All new isolates of Bcc are referred to CFI, Colindale, for molecular sequencing (recA/RFLP) to determine genomovar.

Confirmed or suspected new isolates of Bcc will be communicated to the CF CNS by telephone and to CF consultants by email.
Before a person with CF can be considered as being free from Bcc there should be evidence of at least 3 negative sputum cultures over a period of at least one year, or one induced sputum/BAL after one year.

6.5.3 MRSA

Screening of carriage sites should be performed in accordance with Trust policy. Patients should be screened every three months and on admission to hospital.
New isolates of MRSA will be communicated to the CF team by the IPCT, and managed according to Trust policy.

Eradication of both respiratory and non-respiratory sites should be attempted. Antibiotic regimes should be based on susceptibility testing and discussed with microbiology.

If subsequent clinical samples become negative for MRSA, the patient should still be regarded as a potential carrier from the date of the first negative screen for a total of at least six months. A minimum of 3 negative screens of respiratory samples is required during this six month period, with the final negative screen at least six months after the first negative screen.

6.5.4 Mycobacterium abscessus

Full mycobacterial culture should be requested annually for patients who produce sputum in addition to performing prolonged routine culture of all samples. Full mycobacterial culture should be requested quarterly on patients who produce sputum and who have isolated *M abscessus* within the last year.

New isolates are referred for molecular sequencing (rpoB/hsp65, VNTR) and where appropriate whole genome sequencing to confirm final molecular identification, determine subspecies and identify possible cross transmission.

Confirmed or suspected isolates and (subsequently final molecular identification) will be communicated to the CF CNS and CF consultants by email.

Before a person with CF can be considered as being free from *M abscessus* there should be evidence of at least 4 negative sputum cultures over a period of at least one year off treatment, or one induced sputum/BAL after one year off treatment.
6.5.5 **Respiratory viruses**

Performed on request. Positive results on inpatients are communicated by telephone.

7 **Training**

There are currently no training requirements/elements related to this policy. However it is important to emphasize that all staff must adhere to all relevant trust policies and procedures related to infection prevention and control.

8 **Equality and diversity**

The Trust is committed to ensuring that, as far as is reasonably practicable, the way we provide services to the public and the way we treat our staff reflects their individual needs and does not discriminate against individuals or groups on any grounds. This document has been appropriately assessed.

9 **Monitoring compliance**

<table>
<thead>
<tr>
<th>Standard / process / issue</th>
<th>Monitoring and audit</th>
<th>By</th>
<th>Committee</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROCESS:</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Patients who are colonised as per policy are segregated in outpatients as per policy</td>
<td>Audit</td>
<td>Children’s Outpatients/</td>
<td>IPCC</td>
<td>Annually</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chest Clinic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infection prevention and control procedures are followed</td>
<td>Observational audit</td>
<td>IPCT</td>
<td>IPCC</td>
<td>Annually</td>
</tr>
<tr>
<td>All inpatients are isolated in a single room</td>
<td>Snapshot audit</td>
<td>CF teams</td>
<td>IPCC</td>
<td>Annually</td>
</tr>
<tr>
<td>IPC precautions should be taken as per policy</td>
<td>Observational audit</td>
<td>IPCT</td>
<td>IPCC</td>
<td>Annually</td>
</tr>
<tr>
<td>Advice should be given to patients/relatives at first attendance and reinforced as required</td>
<td>Audit</td>
<td>CF teams</td>
<td>IPCC</td>
<td>Annually</td>
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<tr>
<td>Microbiological specimens should be processed as per policy</td>
<td>Audit</td>
<td>Microbiology</td>
<td>Microbiology CG group</td>
<td>Annually</td>
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<tr>
<td>Significant results as per policy should be communicated as per policy</td>
<td>Audit</td>
<td>Microbiology</td>
<td>Microbiology CG group</td>
<td>Annually</td>
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</tbody>
</table>
OUTCOMES:

<table>
<thead>
<tr>
<th>Infections as per policy are reported to CF Trust Registry annually</th>
<th>Surveillance data as submitted to CF Trust Registry</th>
<th>CF teams</th>
<th>IPCC</th>
<th>Annually</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidents including periods of increased incidence are reviewed as required</td>
<td>Incident reports; surveillance data as submitted to CF Trust Registry</td>
<td>CF teams/ Microbiology/ IPCT</td>
<td>IPCC</td>
<td>Continuously</td>
</tr>
</tbody>
</table>

10 **Consultation and review**

Consultation of this policy was undertaken by members of IPCT and adult and paediatric CF teams.

The policy will be formally reviewed every two years, or as and when significant changes make earlier review necessary.

11 **Implementation (including raising awareness)**

This policy will be available on the Trust intranet and circulated within CF teams.

12 **References**


13 **Associated documentation**

- Adult and Paediatric Guideline Insertion, Management and Removal of Central Venous Catheters
- Cleaning and Disinfection Procedure
- Hand Hygiene policy
- Isolation policy
- MRSA policy

**Policy Authors**
Dr Ali Robb, Consultant Microbiologist
Alan Anderson, Clinical Nurse Specialist, Adult Cystic Fibrosis
Carole Sharp, Clinical Nurse Specialist, Paediatric Cystic Fibrosis
Lesley Wilson, Senior Infection Prevention and Control Nurse
PART 1

1. **Assessment Date:** 30.7.15

2. **Name of policy / strategy / service:**
   Infection Prevention and Control in Cystic Fibrosis Patients (Adult and Paediatric)

3. **Name and designation of Author:**
   Ali Robb, Consultant Microbiologist

4. **Names & designations of those involved in the impact analysis screening process:**
   Ali Robb, Consultant Microbiologist, Lucy Hall; Equality and Diversity Lead

5. **Is this a:**
   - Policy [x]
   - Strategy [ ]
   - Service [ ]

   **Is this:**
   - New [ ]
   - Revised [x]

   **Who is affected**
   - Employees [x]
   - Service Users [x]
   - Wider Community [ ]

6. **What are the main aims, objectives of the policy, strategy, or service and the intended outcomes?**
   (These can be cut and pasted from your policy)
   To outline recommendations for prevention of cross transmission of infection in CF patients.

7. **Does this policy, strategy, or service have any equality implications?**
   Yes [x] No [ ]

   These have been addressed within the policy

   **If No, state reasons and the information used to make this decision, please refer to paragraph 2.3 of the Equality Analysis Guidance before providing reasons:**
### 8. Summary of evidence related to protected characteristics

<table>
<thead>
<tr>
<th>Protected Characteristic</th>
<th>Evidence, i.e. What evidence do you have that the Trust is meeting the needs of people in various protected groups</th>
<th>Does evidence/engagement highlight areas of direct or indirect discrimination? If yes describe steps to be taken to address (by whom, completion date and review date)</th>
<th>Does the evidence highlight any areas to advance opportunities or foster good relations. If yes what steps will be taken? (by whom, completion date and review date)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race / Ethnic origin (including gypsies and travellers)</td>
<td>Interpreting service</td>
<td>Communication support has been shown to reduce communication and medication errors</td>
<td></td>
</tr>
<tr>
<td>Sex (male/ female)</td>
<td>None relevant to this policy</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Religion and Belief</td>
<td>Chaplaincy Team support available</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Sexual orientation including lesbian, gay and bisexual people</td>
<td>None relevant to this policy</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Specialist Children’s Services available</td>
<td>No The policy applies to all ages</td>
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<tr>
<td>Disability – learning difficulties, physical disability, sensory impairment and mental health. Consider the needs of carers in this section</td>
<td>Interpreting service Learning Disability Liaison Nurse Psychological support available for adults and social work support available for children, families and carers.</td>
<td>Communication support has been shown to reduce communication and medication errors. Patients may be isolated for long periods of time. Psychological support is available for adults and social work support for children, families and carers.</td>
<td></td>
</tr>
<tr>
<td>Gender Re-assignment</td>
<td>None relevant to this policy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marriage and Civil Partnership</td>
<td>None relevant to this policy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternity / Pregnancy</td>
<td>Maternity Services support pregnant and nursing mothers</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

### 9. Are there any gaps in the evidence outlined above? If ‘yes’ how will these be rectified?

No
10. Engagement has taken place with people who have protected characteristics and will continue through the Equality Delivery System and the Equality Diversity and Human Rights Group. Please note you may require further engagement in respect of any significant changes to policies, new developments and or changes to service delivery. In such circumstances please contact the Equality and Diversity Lead or the Involvement and Equalities Officer.

Do you require further engagement?  Yes  No  x

11. Could the policy, strategy or service have a negative impact on human rights? (E.g. the right to respect for private and family life, the right to a fair hearing and the right to education?)

No

PART 2

Name: Ali Robb

Date of completion: 10.8.15

(If any reader of this procedural document identifies a potential discriminatory impact that has not been identified, please refer to the Policy Author identified above, together with any suggestions for action required to avoid/reduce the impact.)